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MATHEMATICAL ASPECTS OF SEISMOLOGY

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Abstract:

Every day there are about fifty earthquakes worldwide that are strong enough to be felt locally, and every few days an earthquake occurs that is capable of damaging structures. Each event radiates seismic waves that travel throughout Earth, and several earthquakes per day produce distant ground motions that, although too weak to be felt, are readily detected with modern instruments anywhere on the globe. Seismology is the science that studies these waves and what they tell us about the structure of Earth. Seismology occupies an interesting position within the more general fields of geophysics and Earth sciences. It presents fascinating theoretical problems involving analysis of elastic wave propagation in complex media, but it can also be applied simply as a tool to examine different areas of interest. Applications range from studies of Earth's core, thousands of kilometers below the surface, to detailed mapping of shallow crustal structure to help locate petroleum deposits.

Earthquake:

A sudden ground motion or vibration produced by a rapid release of stored up energy.

Epicenter:

The epicenter is the point on the earth's surface vertically above the focus/hypocenter or point in the crust where a seismic rapture begins.

Crust:

It is the outermost solid shell of a rocky planet/natural satellite which is chemically distinct from underlying mantle.

The crust of earth is compared of a great variety of igneous, metamorphic and sedimentary rocks.

Focus:

The location where the earthquake begins. The ground ruptures at this spot then seismic waves radiate outward in all directions.

Seismology:

It is the scientific study of earthquakes and propagation of elastic waves through the earth and is recorded on seismograph.

Seismograph:

An instrument that measures and records the details of earthquakes such as focus and direction.

Seismic waves:

These are the waves of energy caused by sudden breaking of rock within the earth or an explosion. These are the energy that travels through the earth and id recorded by seismograph.

Fault:

The surface where ruptures start is called fault or fault plane.

Aftershocks: